HOME ENERGY APPRAISAL FORM OF THE TEXAS ASSOCIATION OF BUILDERS

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ABSTRACT

The Home Energy Appraisal Rating form is a versatile, climate specific point system, based on actual performance characteristics of homes throughout Texas. For example, Texas residences often include tinted glass, wide overhangs or sunscreens to shade windows, efficient air conditioners, and air infiltration barriers. These energy conservation features, and many more, are given credit by the Rating System, and result in extra "points" for builders in the total energy assessment of their homes.

The Texas Association of Builders has developed an Energy Rating System for voluntary adoption by homebuilders in the State. The system was developed to insure that suitable credit is given to builders and buyers for the energy conservation features typically included in new homes.

The Home Energy Appraisal Rating Form is a strictly voluntary program--to assist the consumer and the builder in producing and buying energy efficient homes. The form is a single page that is simple to prepare and understand, and it provides the flexibility of selecting any number of energy saving features to achieve the goal of energy efficiency.

INTRODUCTION

The Texas Association of Builders (TAB) is committed to promoting the building of energy efficient homes to preserve our limited supplies of fossil fuels and to produce homes that are efficient to operate. Over the past ten years Texas builders have greatly improved the energy efficiency of homes they have built.

OPPOSED TO ENERGY CODES

The TAB is opposed to the use of energy "codes" because all such programs thus far introduced are of a prescriptive nature making it difficult or impossible to make use of the infinite number of trade-offs that are available when applying energy saving techniques.

THE RATING PROGRAM

Homes produced today are much more energy efficient than those produced just a few years ago. Current homes have higher insulation levels, efficient cooling and heating systems substantial reductions in air infiltration through use of sealants, efficient use of windows and doors, and efficient appliances. The public is also more aware of efficient use of energy.

In order to assist consumers and builders of Texas in producing energy efficient homes, the TAB has developed a voluntary Home Energy Appraisal Rating Program for New Residential Construction. The TAB takes the position that such a system is the most cost effective method of achieving the desired conservation results in selecting energy saving features.

TECHNICAL VALIDITY

The Home Energy Appraisal Form was developed with the technical advice of Steven Winter Associates of New York, New York, an internationally recognized firm of experts in the design of energy efficient structures.

The computer programs and data base developed for the Department of Energy (DOE 2.1) by the Lawrence Beckeley Laboratories (LBL) in Berkeley, California for the purpose of performing energy simulations for buildings were used by Steven Winter Associates in developing the rating points for the TAB rating forms for the six designated areas of Texas. LBL also developed the data base for Affordable Housing through Energy Conservation Guidelines in cooperation with Steven Winter Associates. This data base was also used for the Energy Conservation Standards for federally procurred residences, which will be issued for public comment in the near future.

The technical data used in the rating form and rating points were reviewed and approved by the National Association of Home Builders as being equivalent to their widely accepted Thermal Performance Guidelines. This approval also qualifies the rating form for underwriting guidelines for energy efficient homes by the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporations (Freddie Mae).

QUALIFICATION

A home qualifying with a minimum of 100 points will be deemed to be an energy efficient structure and eligible for the benefits of being so designated.

There may be certain bizarre circumstances under which a home could qualify with 100 points even though it may not be reasonable - such as a home with excessive glass or unreasonable air infiltration. However, the building of such a structure has been the rare occasion that has generally not been accepted in the market place. The rating form was designed to address actual existing construction, not structures that could theoretically be designed.

Proceedings of the Third Symposium on Improving Building Systems in Hot and Humid Climates, Arlington, TX, November 18-19, 1986

GEOGRAPHIC VARIATIONS

The State of Texas comprises a vast land area and contains several sub-climates. The DOE 2.1 data base was used in designating six climatic zones for purposes of the rating form. Different rating points have been developed for each of the specific climatic conditions. All of the major urban areas identified have been assigned to one of the six zones. The six zones are: Amarillo, Dallas/ Fort Worth, El Paso, Houston, McAllen, and San Antonio.

BENEFITS

In addition to achieving the desired goal of producing energy efficient residential structures, a home qualifying as energy efficient will also qualify purchasers to receive higher appraised values or allow them to qualify for higher debt-to-income ratios on their mortgages.

Home purchasers are therefore given credit for the extra cost of energy conservation items and for the reduced cost of operating an energy efficient home.

The benefit is to promote efficiency and qualify more buyers to purchase their own home, which is still part of the American Dream.

COMPONENTS OF THE PROGRAM

The Rating Program developed by the TAB consists of a simple one page form (See sample that follows) for rating each home and explanatory booklets for the consumer and the builder. Rating points are assigned for each of the items affecting the energy efficiency of the home. A home achieving 100 points is considered to be energy efficient and should reduce energy consumption from 13 to over 25 million btu's per year, depending on the climatic zone in Texas. This will translate to an energy savings from $300 to over $600 per year at current utility rates. Although the impact may be somewhat lessened in today's energy markets, it must be kept in mind that homes built today will be in use well into the next century. Energy conservation will most assuredly become a major factor sometime in the next 50 years.

The explanatory booklets for the consumer and builder are an integral part of the Home Energy Appraisal Rating Program. However, because they are quite lengthy, they are not reproduced here.

The Consumer guide explains the importance of energy conservation and basics of how the program works. The Consumer guide, along with the rating form, is designed to be kept by the homebuyer with other important household documents.

The Builders guide is a more detailed explanation of how the program works. Each of the Thermal Integrity Items found on the form is discussed in detail.

THE RATING FORM

A VOLUNTARY

HOME ENERGY APPRAISAL RATING PROGRAM FOR NEW RESIDENTIAL CONSTRUCTION

IN THE STATE OF TEXAS

Homebuilders have recognized the need to make the best use of energy and are using energy saving construction systems and techniques. Significant steps to reduce energy consumption in residences have been made. To serve as a guide in evaluating energy conserving features in residences, the attached simplified rating form has been devised for use by these builders, their customers and others. The more significant factors affecting energy consumption are included on the form. Of course, no energy rating system can be totally accurate, because of the complexity of energy conservation and interaction of the various factors. A value given to one factor for example is dependent upon the number and value of other energy saving features included in a house. Some items, such as ceiling fans, are difficult to evaluate although they do affect comfort. Nevertheless, including features in a home that have sufficient energy saving value points according to the form will accomplish the ultimate goal, more energy efficient homes.

The energy management residential goal is a minimum of 100 points using any combination of factors on the form. Additional points are desirable and can further reduce energy use. There are distinct climatic zones within Texas. The value points in the Home Energy Appraisal Rating Program have been adjusted to meet these local conditions. As new information and technology become available, values and factors will be adjusted and further refined.

Although the goal is to obtain 100 points, some homes being built today exceed this by a wide margin. This attests to the fact that the Texas building industry is doing an excellent job of adapting to the needs of society without burdening the taxpayers with expensive government regulations. Texas builders are proud of their ability to meet the housing needs. Their pride is justified by the fact that year after year Texas builds the highest number of new homes in the country. These builders pledge to continue to provide Texans with the best housing available in the world.

TEXAS ASSOCIATION OF BUILDERS

HOME ENERGY APPRAISAL RATING FORM

Location: Houston

PLEASE NOTE

The Texas Association of Builders has designed this Home Energy Appraisal Rating form, but the Association does not conduct inspections of homes, nor does it prepare this report. As a member of the Association, your builder has chosen to participate in this voluntary program. This program is designed to provide you with additional information concerning the energy efficiency of the home described herein so that you may make a more informed decision concerning the home.

HOWEVER, NEITHER THE INFORMATION NOR RATING COMPILED HERE CONSTITUTES A WARRANTY OR REPRESENTATION BY THE BUILDER OR THE ASSOCIATION OF THE ENERGY FEATURES OR OVERALL ENERGY EFFICIENCY OF THIS HOME.

THERMAL INTEGRITY ITEMS

	Assigned Points	Rated Points
1. GLAZED AREAS (Window, French and Patio Doors, Etc.)		
A. Amount and Glazing Type		

Type of Glass	Percentage of Glazed Area to Floor Area (%) 8–10	11–12	13–14	15–17	18+
Single Pane	33	26	20	12	0
Double Pane*	40	34	29	24	15

*Insulated or single pane with storm

If more than one type of glass is used, multiply the points selected above by the appropriate percentage
Single pane points _____ × _____% of single glass plus
Insulated pane points _____ × _____% of insulated glass to total _____

B. Sash Type		
Wood or Metal with Thermal break	2	_____
C. Solar Control		
Multiply your gross glazed square footage (excluding North facing) by the factors below:		
Tinted glass, Reflective coating or Permanent Shades or Extended Overhangs		
_____ sq.ft. × 0.018		
Sun screens or removable shading		
_____ sq.ft. × 0.048		_____
2. EXTERIOR DOORS (Other than Glass)		
Solid or Hollow Core	0	
Insulated or Storm Door	1	_____
3. FLOORS		
A. Slab or Unvented Pier and Beam		
R-0 Perimeter Insulation	0	
R-5 Perimeter Insulation	15	
R-7.5 Perimeter Insulation	16	
R-10 Perimeter Insulation	17	
B. Vented Pier and Beam		
R-11 to R-18 Insulation Installed	16	
R-19 and Above Insulation Installed	22	_____
4. EXTERIOR WALLS		
R-6 to R-10	13	
R-11 to R-12	17	
R-13 to R-14	18	
R-15 to R-18	19	
R-19 to R-22	20	
R-23 and above	22	_____
Note: Add R-value of insulation material to R-value of sheathing (if any) to obtain above R-value		
5. CEILING OVER CONDITIONED AREA		
(Adequate attic ventilation must be provided)		
R-13 to R-17	41	
R-18 to R-20	43	
R-21 to R-24	44	
R-25 to R-28	45	
R-29 to R-31	47	
R-32 and Above	49	_____
Note: Insulation Material Installed		
6. INFILTRATION OF UNCONDITIONED AIR		
A. Soleplate Area Sealed	7	_____
B. Wiring and Plumbing Holes Sealed	6	_____
C. Exterior Doors and Windows Weather-Stripped	2	_____
D. Exterior Doors and Windows Rough Opening Caulked	4	_____
E. Attic and Basement Access in Conditioned Space Weather-Stripped	1	_____
F. Outside Sheathing Holes Sealed, and/or Air Infiltration Barrier Installed, Furr downs Sealed	1	_____
G. Ventless or Dampered Range Hood Installed, Dampered Dryer Exhaust	3	_____
7. FIREPLACES		
No Fireplace	3	
Fireplace with Damper, Glass Screen, Make-Up Air Intake	2	
Fireplace with Damper and Make-Up Air Intake	1	
Fireplace with Damper and Glass Screen	0	
Fireplace with Damper Only	0	_____
8. DUCT SYSTEM INSULATION/LOCATION		
A. Ducts in Conditioned Space or No Ducts	14	_____
B. Ducts in Attic or Unconditioned Space		

Type	Attic	Unconditioned
R-4 Flex or R-6 Metal	0	3
R-6 Flex or Rigid Duct Board	3	5
R-8 Duct Insulation	5	6
R-10 Duct Insulation	6	7

_____

9. AIR HANDLER AND/OR HEATING UNIT LOCATION		
Attic Space	0	
Unconditioned Space	1	
Conditioned Space	2	_____
10. NUMBER OF STORIES		
Single Story	0	
One and One-Half Story	7	
Two or More Stories	12	_____

Total Rated Points This Page ☐

AIR CONDITIONING AND HEATING EQUIPMENT

The efficiency of air conditioning and heating equipment is rated by the manufacturers. Add the factors assigned to your cooling and heating equipment and multiply the result by the Thermal Integrity Rated Points earned thus far to determine the total number of rated points earned.

1. AIR CONDITIONING – Electric and Gas (Should be properly sized)

Seasonal Energy Efficiency Ratio (SEER)	A/C Factor
Less than 7.0	0.65
7.0 to 7.9	0.75
8.0 to 8.9	0.85
9.0 to 9.9	0.95
10.0 and over	1.05

Multiple zone system multiply the A/C factor by 1.20

A/C Factor _____

2. HEATING – (Should be properly sized)

A. Elecric heat pump

Heating Seasonal Performance Factor (HSPF)	Heating Factor
Less than 5.0	0.23
5.1 to 5.9	0.25
6.0 to 6.9	0.30
7.0 to 7.9	0.34
8.0 to 8.9	0.39
9 and above	0.43

B. Electric furnace or baseboard 0.25

C. Gas and Oil

Annual Fuel Utilization Efficiency (AFUE)	
Less than 60%	0.25
61 to 70	0.30
71 to 80	0.34
81 to 90	0.39
Over 90	0.43

Multiple zone system multiply the Heating Factor by 1.20

Heating Factor _____

Air conditioning factor _____ + Heating factor _____

= Equipment Factor _____

Total Rated points from previous page _____

× Equipment Factor _____ =

Total Rated Points For This Home ☐

ENERGY SAVING CHECK LIST

The Energy Saving Checks earned below result from optional equipment installed in the home. These items should not be considered when arnving at the 100 point goal. However, installation of this equipment when properly used can represent substantial savings in the operation of this home.

Computerized Energy Management System	———
Automatic Set Back Thermostat	———
Insulated Water Heater	———
Whole House Fan	———
Ceiling Fan	———
Flourescent Light Fixtures	———
High Efficiency Appliances	
Dishwasher	———
Refrigerator	———
Range and Oven	———
Microwave	———
Solar Assisted Water Heater	———
Total Energy Savings Checks	☐

APPROVED BY THE NATIONAL ASSOCIATION OF HOME BUILDERS

AS EQUIVALENT TO THERMAL PERFORMANCE GUIDELINES (TPG'S).